

REMARKS

Reconsideration of this application is requested.

With entry of this amendment, the pending claims are claims 1, 3-13, 18, 22-24 and 26-28.

Claim 1 has been amended to include the limitations of claim 2, the latter being canceled to avoid redundancy.

The amendment of claim 1 obviates the Examiner's objection to the now deleted Markush group in the 22nd line after Formula I.

Claims 4 and 28 have been amended in view of the Examiner's Section 112, 2nd ¶ rejection thereof. What the applicants meant by the phrase "in the region above 400 nm at or above 750 nm" in claim 4, as previously presented, was that the compound absorbs radiation in the region above 400 nm but that of all the absorption above 400 nm, at least 90% of it is at or above 750 nm (i.e. with 10% or less being in the interval 400-750 nm).

Claims 4 and 28 have been amended appropriately and it is respectfully submitted that claims 4 and 28, as amended, are clear and definite.

Claim 12 has also been amended to avoid redundancy in view of the amendment of claim 1.

In view of the changes in claims 1, 4 and 28, the Examiner is requested to withdraw the Section 112, 2nd ¶ rejection of these claims.

The indicated amendment of claim 1 to include the features of claim 2 should obviate the Examiner Section 102(b) rejection of claims 1, 3-11, 13, 28 and 28 (sic) as anticipated by Kaieda et al. U.S. 5,712,332, it being noted that claim 2 was not included in this rejection. Detailed comment on this rejection is not thought to be necessary as the subject matter of claim 1 as amended is admittedly novel over Kaieda et al. and the other rejected claims depend, directly or indirectly, from claim 1. Accordingly, reconsideration and withdrawal of the Section 102(b) rejection is requested.

The Examiner is also requested to reconsider the Section 103(a) rejection of claims 1-13, 18, 22 and 26-28 as unpatentable over EP 0 155 780. The applicants respectfully submit that the claims define subject matter which is not obvious from EP 0 155 780.

The EP reference teaches a "first preferred class" of compounds (page 2, lines 21-28) and a "second preferred class" of compounds (page 2, line 29 to page 3, line 2). The second preferred class of compounds is required to have 9-16

substituents and “especially valuable” compounds are said to have “15 or 16” substituents (page 2, lines 37-38). It is immediately apparent that this second preferred class of compounds teaches away from the present claims which, as amended, require that each of R^2 , R^3 , R^6 , R^7 , R^{10} , R^{11} , R^{14} and R^{15} is hydrogen. Thus, only the first preferred class of compounds really needs to be considered any further.

The general description in the EP reference mentions 3 possibilities for the center of the phthalocyanine nucleus: that it is metal-free (i.e. $M = \text{hydrogen}$); that it contains a metal; or that it contains an oxy-metal (see page 4, lines 15-19). However, when it comes to preferences, it is evident that the EP reference clearly does not favor the oxy-metal possibility. For one thing, the list at page 2, lines 19-21 contains 13 options but only 2 of these are oxy-metals (Gallanyl and Vaadyl), with the other 11 being metals. This is a clear indication in the EP reference that metals rather than oxy-metals, are regarded as the more favored option. Moreover, of the oxy-metals mentioned, only 1 (Vanadyl) overlaps with the present claims. Importantly, the prior art then specifies “suitable” compounds as being of Formula III (page 4, lines 22-34). In Formula III, the phthalocyanine has a center, M , which must be a metal atom or hydrogen. This confirms the preference for metal or metal-free phthalocyanines rather than oxy-metal phthalocyanines. Still further evidence of the non-preference for oxy-metals is the fact that the reference contains a very large number of exemplified compounds in the Examples (66 in all), but not one single exemplified compound contains an oxy-metal.

In addition to the phthalocyanine nucleus, the phthalocyanine's peripheral substitution must also be considered. The present claims require not only a specific oxy-metal center but also, in combination therewith, a specific peripheral substitution pattern of specific substituents which is limited with respect to the possible substituent groups and patterns disclosed in the EP reference.

The present claims require all 8 of the “3,6” positioned substituents to be $-X-J$ and to be identical, wherein J is $C_{1-6}\text{alkyl}$; $C_{2-6}\text{alkenyl}$; $C_{4-6}\text{cycloalkyl}$ or $C_{6-12}\text{aryl}$, each of which may be optionally substituted as specified in claim 1. In contrast, the EP reference merely requires any “organic radical” (see claim 1 of the reference). Even in the detailed list of organic radicals in the EP reference, there are many possibilities which are exemplified which do not fall within the limited substituent list of the present claims. For instance, where J is $C_{6-12}\text{aryl}$ in the present claims, the aryl group is optionally substituted by relatively small groups such as $C_{1-3}\text{alkyl}$, $C_{1-3}\text{alkoxy}$, $C_{1-3}\text{alkylthio}$, etc. This contrasts with the prior art where the substituents for the aryl

radical may be any alkyl, alkenyl, etc., especially containing up to 20 carbon atoms (see page 3, lines 24-27). In fact, of the 66 Examples in the EP reference, only 8 (Examples 1-3, 9-11, 15 and 59) appear to have peripheral substitution patterns which would meet the peripheral substitution pattern requirements of the present claims. That is, only 13% (i.e. 8 out of 66) of the Examples in the prior art have the required peripheral substituent pattern of the present claims and none have the required oxy-metal center. For information, the other Examples in Table 1 on page 12 of the EP reference do not have the required substituent pattern because they either have too few -X-J groups (e.g. the penta-, hexa- and hepta-substituted compounds) or else the substituents on the aryl group is not C₁₋₃alkyl as required by the present claims. The other Examples in Tables 2-5 do not have the required substituent pattern because they have too many (i.e. more than 8) -X-J groups.

In other words, in order to arrive at the present claims from the EP reference, one of ordinary skill in the art would have to be motivated to select the one specific oxy-metal (Vanadyl) from the list of 13 possible options in the list on page 4, lines 19-21 (in fact, 14 possible options when the option of hydrogen is included) and then combine it with the small minority (13%) of Examples in the reference which would be necessary to arrive at the present invention. Statistically, therefore, this is a very unlikely combination to make from the EP reference. One can see that the number of possible combinations of phthalocyanine centers with the Examples is 14 x 66 (i.e. 14 possible options for the metal center and 66 Examples in the reference), making a total of 924 possible combinations. However, the number of possible combinations which would fall within the present invention is merely 1 x 8 (i.e. 1 center Vanadyl combined with any of the 8 Examples with the required substitution pattern as described above), making a total of 8 possible combinations. Therefore, the proportion of the total possible combinations in the EP reference which would overlap with the present claims is a mere $8/924 \times 100\%$ (= 0.9%). This clearly shows that the present invention claims a very narrow selection with respect to the EP reference.

As the applicants argued in response to the previous Office Action, the compounds presently claimed have higher A_{\max} than the prior art compounds together with high E_{\max} values. For instance, the Table on page 33 of the present application shows that the applicants' compounds have a very high A_{\max} from 829-851 nm and high E_{\max} from 167,000-185,000. These properties are important for infra-red absorbing dyes, especially for use in security methods. In contrast, the prior art compounds in the EP reference generally have much lower values for A_{\max} , it being mostly around 800 nm and lower. Thus, the presently claimed compounds

show an improvement in properties over the prior art. There is nothing in the EP reference to suggest that the applicants' narrow group of compounds would demonstrate such improved properties.


It is notable that the 13% of Examples in the prior art mentioned above which have the required substitution pattern of the present claims do not have any remarkable properties over the other Examples. For instance, the A_{max} values for those Examples range from 797-813 nm. Thus, there is not even anything to suggest an expectation of success in selecting one of the 13% of Examples to combine with Vanadyl, one of the 14 possible options for the phthalocyanine center.

In brief, therefore, the applicants submit that the compounds called for in their claims represent a novel and advantageous selection of compounds embraced, but not disclosed, by the EP reference. Accordingly, it is urged that the claims, particularly as amended, define subject matter which is patentable over the EP disclosure. Withdrawal of the Section 103(a) rejection of claims 1-13, 18, 22 and 26-28 based on EP 0 155 780 is, therefore, requested.

The Examiner is also requested to reconsider the Section 103(a) rejection of claims 23 and 24 as unpatentable over the aforementioned EP 0 155 780 considered with Albert et al. U.S. 5,282,894. The secondary reference does not fill in the substantive deficiencies of the EP disclosure as discussed above. Accordingly, withdrawal of the rejection of claims 23 and 24 is requested.

The application is thought to be in condition for allowance and such action is requested.

Respectfully submitted,
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